
भू-स्थानिक सूचना के लिए मेटाडेटा मानक

Metadata Standard for Geospatial Information

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भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुरशाह ज़फर मार्ग, नई दिल्ली-110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI-110002
www.bis.org.in www.standardsbis.in

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Geospatial Information Sectional Committee had been approved by the Electronics and Information Technology Division Council.

India has a vast amount of map information generated through systematic topographic, geological, soil, cadastral surveys and various natural resources information generated with the use of the remote sensing data. Spatial information is expected to play a pivotal role in the sustainable development of natural resources. It is desirable to have a common set of data standards and metadata definitions for sharing the data and information transparently among government and non-government organizations, academia, industry and citizens.

Metadata serves two major purposes — both for the spatial data generator and for the spatial data user. For the generator, the metadata provides a framework to document the spatial data and declare its content for users. For the user, metadata serves many important purposes, including finding the spatial data as per need; browsing spatial data; deciding on whether the spatial data will meet the application need; finding how the spatial data can be accessed and processing of geo-spatial information for various data generating agencies.

The Committee responsible for the formulation of this standard has reviewed the provisions of the international publications listed in Annex A and has decided that these may be used in conjunction with this standard till Indian Standards on these subjects are published.

Assistance has been drawn from ISO 19115 : 2003 ‘Geographic information — Metadata, National Natural Resources Management System (NNRMS)/Natural Resources Database (NRDB) Standards and National Spatial Data Infrastructure (NSDI) Metadata standard Version 2.0’ while formulating this standard.

The composition of the Committee responsible for the formulation of this standard is given in Annex C.

Indian Standard

METADATA STANDARD FOR GEOSPATIAL INFORMATION

1 SCOPE

This standard specifies metadata to provide a framework for documenting the spatial data and declare its content for the users. It facilitates finding spatial data as per their needs and deciding whether the spatial data meets the specific application requirement. The metadata standards allow describing the dataset in order to understand the uses and limitations of the data while distributing amongst the organizations. It provides a key to the information on the schema which describes the information about the data and distribution of dataset where the fields are clearly mentioned as mandatory or optional. In addition to the standards that are given, the information exchange can be extended using parameters like hardcopy of map, translation, chart production, etc.

2 REFERENCES

The standards listed in Annex A contains provisions, which through reference in this text constitute

provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 TERMS AND DEFINITIONS

For the purpose of this standard, the terms and definitions given in Annex B shall apply.

4 REQUIREMENTS OF METADATA STANDARD

The requirements of metadata elements and schema shall be as specified in Table 1. Table 1 specifies the mandatory and optional metadata elements. However, optional metadata elements may be provided as agreed between user and supplier.

Table 1 Metadata Standard for Mandatory Elements and Schema

(Clause 4)

Sl No.	Elements	Schema	Mandatory / Optional
i)	Data identification information	Dataset_Title Name_Of_The_Data Keywords Access_Constraints Use_Constraints Purpose_Of_Creating_Data Data_Type Metadata_Standard_Version Audience Availability DQ_Topological_Consistency	Mandatory Theme
ii)	Contact information	Contact_Person Organization Mailing_Address City Country Contact_Telephone Contact_Fax Contact_Email	Mandatory
iii)	Coverage	X_Minimum X_Maximum Y_Minimum Y_Maximum T_Late	

SI No.	Elements	Schema	Mandatory / Optional
		T_Early Place_Name Period_Name Spatial_Resolution Spatial_Georeference Spatial_Aggregation Temporal_Precision Temporal_Interval Temporal_Aggregation Note Alternative_Metadata	Mandatory
iv)	Geographic location of the dataset (by four coordinates or by description)	Geographic_Bounding_Box Or Geographic_Description	Optional
v)	Citation	Data_Prepared_By Original_Source Source_Scale_And_Date_Mapping Year_Digitizing_Year_ Survey_Year Lineage Associated_Project_Preparing_The_Data Associated_Publications_Person.Email Individual_Name Corporate_Name_And_Address	Mandatory
vi)	Metadata date stamp	Metadata_datestamp (<i>as per</i> ISO 8601)	Mandatory
vii)	Type	Data_Format	Optional
		Data_File_Size Data_Physical_Location_(Computer + Path)	
viii)	Subject	Subject_Specific Subject_Domain	Optional
ix)	Description	Description Description_History	Optional
x)	Publisher	Publisher Publisher_Address	Optional
xi)	Dataset responsible party	Responsible_Party	Optional
xii)	Distribution format	Format	Optional
xiii)	On-line resource	Onlineresource	Optional
xiv)	Dataset topic category	Dataidentification.Topiccategory	Mandatory
xv)	Language	Language (<i>as per</i> ISO 639-2)	Mandatory
xvi)	Abstract describing the data	Data_Identification_Abstract	Mandatory
xvii)	Spatial representation type	Data_Identification_Spatial_Representation_Type	Optional
xviii)	Spatial resolution of the dataset	Resolution.Distance Or Resolution.Equivalentscale	Optional
xix)	Reference system	Rs_Identifier	Optional
xx)	Temporal extent information for the dataset	Extent.Temporalelement	Optional
xxi)	Vertical extent Information for the Dataset	Vertical extent	Optional
xxii)	Quicklook	Graphic_File_Format/Map_In_Encrypted_Mode	Optional
xxiii)	For Image Data	Name_Of_The__Satellite Sensor Path Row Image_Acquired_From Date_And_Time_Of_Image File_Format Bits_Per_Pixel Spatial_Resolution Spatial_Resolution_Unit Number_Of_Bands Number_Of_Rows Number_Of_Cols Purchased_Or_Obtained_On_Exchange_Basic	Mandatory
xxiv)	Rights	Rights	Optional
xxv)	Team (organization Name'xxxxx')	xxxxxx_team xxxxxx_expert_commentary xxxxxx_expert_internal_notes	Optional

Sl No.	Elements	Schema	Mandatory / Optional
xxvi)	Attributes/Entity and attribute information	Entity_And_Attribute_Overview And/Or Entity_And_Attribute_Detailed_Description (If the data includes a database that is not documented, you are strongly encouraged to develop the detailed description)	Optional
xxvii)	Projection information	Name_Of_Projection UnitProjection_Parameters	Optional
xxviii)	Data quality	Logical_Consistency_Report Completeness_Report Process_Description Process_Date Source_Originator Source_Publication_Date Source_Title Source_Online_Linkage Source_Scale_Denominator Type_Of_Source_Media Source_Time_Period_Of_Content Source_Currentness_Reference Source_Citation_-_Abbreviation Source_Contribution If Data Assessments Performed: Attribute_Accuracy_Report (If Applicable) Horizontal_Positional_Accuracy_Report (If Applicable) Vertical_Positional_Accuracy_Report (If Applicable)	Optional
xxix)	Online resource information	CI_Online_resource Linkage Protocol Application_Profile Name Description Instructions	Mandatory

ANNEX A

(Foreword)

LIST OF REFERRED INTERNATIONAL STANDARDS

<i>International Standard</i>	<i>Title</i>
ISO 639-2 : 1998	Codes for the representation of names of languages — Part 2: Alpha- 3 code
ISO 8601 : 2004	Data elements and interchange formats — Information interchange — Representation of dates and times

ANNEX B

(Clause 3)

TERMS AND DEFINITIONS

Abstraction – A way of viewing a real world object, usually a simplification. For example, a road may be represented as a centreline in one application and an area bounded by kerblines in another.

Accuracy – The closeness of results of observations, computations or estimates to the true values or the values accepted as being true.

Altitude – Elevation above or below a reference datum, as defined in Federal Information Processing Standard 70-1.

Area – A generic term for a bounded, continuous, two-dimensional object that may or may not include its boundary. **Attribute** – Defined characteristic of an entity type (for example, composition).

Attribute value – A specific quality or quantity assigned to an attribute (for example, steel), for a specific entity instance. **Content** – In ArcWeb Services, data that may include data files, layers, or services.

Coordinates – The pairs of numbers expressing horizontal distances along orthogonal axes; alternatively, triplets of numbers measuring horizontal and vertical distances.

Coverage – A digital version of a map forming the basic unit of vector data storage in ARC/INFO. A coverage stores geographic features as primary features (such as arcs, nodes, polygons, and label points) and secondary features (such as ties, mapextent, links, and annotation) Associated feature attribute tables describe and store attributes of the geographic features.

Data – Any collection of related facts arranged in a particular format; often, the basic elements of information that are produced, stored, or processed by a computer.

Database – A logical collection of inter related information, managed and stored as a unit, usually on some form of mass storage system such as magnetic tape or disk. A GIS database includes data about the spatial locations and shape of geographic features recorded as points, lines, pixels, grid cells or tins as well as their attributes.

Data Element – A logically primitive item of data.

Data Format – The structure used to store a computer file or record **Data set** – a collection of related data.

Data Type – The characteristics of columns and variables that defined what types of data values they

can store. Examples include character, floating point and integer.

Digital Image – Two dimensional array of regularly spaced picture elements (pixels) constituting a picture.

Domain – In the definition of the elements in the metadata standard, the domain identifies valid values for a data element.

Elevation – Conforming to Federal Information Processing Standard 70-1, the term ‘altitude’ is used in this standard, rather than the common term elevation.

Entity Instance – A spatial phenomenon of a defined type that is embedded in one or more phenomena of different type, or that has at least one key attribute value different from the corresponding attribute values of surrounding phenomena (for example, the 10 Street Bridge).

Entity Point – A point used for identifying the location of point features (or areal features collapsed to a point), such as towers, buoys, buildings, places, etc.

Entity Type – Definition and description of a set into which similar entity instances are classified (e.g., bridge).

Geospatial Data – An information that identifies the geographic location and characteristics of natural or constructed features and boundaries on the earth. This information may be derived from, among other things, remote sensing, mapping, and surveying technologies.

GIS – The GIS stands for Geographic Information System. A Geographic Information System is a computer system designed to allow users to collect, manage, and analyze large volumes of spatially referenced and associated attribute data. The major components of a GIS are: a user interface; system/database management capabilities; database creation/data entry capacity; spatial data manipulation and analysis packages; and display/product generation functions; from USGS Open File Report 88-105 (A process for evaluating Geographic Information Systems). In the broadest sense, a GIS is any integrated system of information that includes a geographic component.

Horizontal – The tangent to the geoid or parallel to a plane that is tangent to the geoid.

Interface – The type of signal protocol for connecting computer devices. You can only connect a peripheral device to a microcomputer through a matching

interface. Common interface types include serial, parallel, SCSI and GPIB.

Interoperability – The capability of components or systems to exchange data with other components or systems, or to perform in multiple environments. In GIS, interoperability is required for a GIS user using software from one vendor to study data compiled with GIS software from a different provider

Label Point – A reference point used for displaying map and chart text (for example, feature names) to assist in feature identification.

Latitude – An angular distance measured on a meridian north or south from the equator.

Layer – An integrated, areally distributed, set of spatial data usually representing entity instances within one theme, or having one common attribute or attribute value in an association of spatial objects. In the context of raster data, a layer is specifically a two-dimensional array of scalar values associated with all of part of a grid or image.

Longitude – Angular distance between the plane of a meridian east or west from the plane of the meridian of Greenwich. **Map** – Spatial representation, usually graphic on a flat surface, of spatial phenomena.

Media – The physical devices used to record, store, and (or) transmit data. **Meridian** – A great circle on the Earth that passes through the geographic poles.

Metadata – Data about the content, quality, condition, and other characteristics of data.

National Geospatial Data Clearinghouse – Distributed network of geospatial data producers, managers, and users linked electronically. Building on initiatives such as the national information infrastructure, the clearinghouse uses a distributed, electronically connected network, such as the Internet. Each data provider will describe available data in an electronic form, and provide these descriptions (or metadata) using means that can be accessed over a communications network. Thus, the data for the clearinghouse are located at the sites of data producers (or, where more efficient, at the sites of intermediaries) throughout the country. Using the network, users will search these descriptions to locate data that are suitable for their applications.

Node – Zero-dimensional object that is a topological junction of two or more links or chains, or an end point of a link or chain.

Coordinate – The coordinate of a point in a plane cartesian coordinate system obtained by measuring parallel to the y-axis (the ‘y’ value).

Pixel – Two-dimensional picture element that is the smallest non divisible element of a digital image. **Raster** – One or more overlapping layers for the same grid or digital image.

Resolution – The minimum difference between two independently measured or computed values which can be distinguished by the measurement or analytical method being considered or used.

Scale – The ratio or relationship between a distance or area on a map and the corresponding distance or area on the ground, commonly expressed as a fraction or ratio. A map scale of 1/100 000 or 1:100 000 means that one unit of measure on the map equals 100 000 of the same unit on the earth.

Schema – The structure or design of a database or database object, such as a table, view, index, stored procedure, or trigger. In a relational database, the schema defines the tables, the fields in each table, the relationships between fields and tables, and the grouping of objects within the database. Schemas are generally documented in a data dictionary. A database schema provides a logical classification of database objects.

Source – The component of an extended element. The name of the individual or organization creating an extended element **spatial** – An adjective applied to objects that vary in space in two or three dimensions.

Table – A database is organized into tables that contain records. Tables cover different topics related to the same common theme. The theme and its extent of development determine the number of tables that comprise the database.

For example, the Crow Butte soil polygon database contains twelve tables, in such areas as yield, crop potential, and statistical information (*see also* database object, field, record).

Temporal extent – All the temporal information, including the earliest and last observations, of a data layer in ArcGIS Tracking Analyst.

Topological Consistency – It is the mathematical algorithm which defines the relationship between different spatial features.

Vertical – At right angles to the horizontal; includes altitude and depth.

ANNEX C*(Foreword)***COMMITTEE COMPOSITION****Geospatial Information Sectional Committee, LITD 22**

<i>Organization</i>	<i>Representative(s)</i>
National Spatial Data Infrastructure (NSDI) Division, New Delhi	MAJ GEN (DR) R. SIVA KUMAR (<i>Chairman</i>) SHRI P. S. ACHARYA (<i>Alternate I</i>) SHRI NIRMALENDU KUMAR (<i>Alternate II</i>) DR DEVENDRA SINGH (<i>Alternate III</i>)
Central Ground Water Board, Faridabad	SHRI S. K. SINHA DR N. VARADARAJ (<i>Alternate</i>)
Census of India, Delhi,	SHRI A. P. SINGH SHRI R. JOSEPH (<i>Alternate</i>)
Central Pollution Control Board, Delhi	SHRI ANAND KUMAR MS. SMRITI K. UPADHYAY (<i>Alternate</i>)
Central Statistical Organisation, New Delhi, New Delhi	Shri P. C. Mohanan
Central Water Commission, New Delhi, New Delhi	DR YOGESH PAITHANKAR
Earth Resources Data Analysis Systems, Gurgaon	SHRI KAUSHIK CHAKRAVARTY WG CDR A. K. JHA (<i>Alternate</i>)
ESRI, New Delhi	DR RAJESH MATHUR
Forest Survey of India, Dehradun, Dehradun	SHRI M. L. SHRIVASTAVA SHRI RAJBIR SINGH (<i>Alternate</i>)
Geological Survey of India, New Delhi	SHRI S. K. BOHRA SHRIMATI PUSHP LATA (<i>Alternate</i>)
Indian Institute of Remote Sensing, Dehradun	DR P. S. ROY DR PLN RAJU (<i>Alternate</i>)
Indian Institute of Technology, Bombay, Bombay	PROF N. L. SARDA DR SMITA SENGUPTA (<i>Alternate</i>)
Indian Institute of Technology, Kharagpur, Kharagpur	DR S. K. GOSH
Indian Meteorological Department, New Delhi	SHRI RAHUL SAXENA SHRI N. K. PANGASA (<i>Alternate</i>)
Indian Naval Hydrographic Department, New Delhi, New Delhi	CDR K. M. NAIR SHRI B. K. RAMPRASAD (<i>Alternate</i>)
Karnataka State Council, Bangalore, Bangalore	SHRI HEMANT KUMAR
Ministry of Defence	MAJ GEN S. V. CHINAWAR
National Atlas and Thematic Mapping Organization, Kolkata, Kolkata	PROF (DR) V. C. JHA DR C. M. RAO (<i>Alternate</i>)
National Bureau of Soil Survey and Land use, Nagpur, Nagpur	DR DIPAK SARKAR DR G. P. OBI REDDY (<i>Alternate</i>)
National Council for Applied Economics Research, New Delhi, New Delhi	SHRI RAKESH KUMAR SRIVASTAVA
National Disaster Management Authority, New Delhi	COL B. B. SINGH
National Informatics Centre (NIC), New Delhi	DR VANDANA SHARMA SHRI VISHU CHANDRA (<i>Alternate</i>)
National Remote Sensing Centre, Hyderabad	DR. VENU GOPAL RAO
Navyuga Spatial Technology, New Delhi	DR ANIRUDHA ROY
Rolta, Hyderabad	DR C. R. BANUR
Space Applications Centre, ISRO, Hyderabad	DR SHASHIKANT A. SHARMA
Survey of India, Hyderabad	SHRI R. N. NANDA SHRI NITIN JOSHI (<i>Alternate</i>)

<i>Organization</i>	<i>Representative(s)</i>
BIS Directorate General	SHRI D. GOSWAMI, Scientist 'F' and Head (LITD) [Representing Director General (<i>Ex-officio</i>)]

Member Secretary
SHRI ASHISH TIWARI
Scientist 'B' (LITD), BIS

Composition of Working Group for Metadata Standard for Geospatial Information
under, LITD 22

<i>Organization</i>	<i>Representative(s)</i>
National Spatial Data Infrastructure (NSDI) Division, New Delhi	SHRI P. S. ACHARYA (<i>Convener</i>) SHRI NIRMALENDU (<i>Alternate</i>)
Census of India, Delhi	SHRI A. P. SINGH
Geological Survey of India, New Delhi	SHRI S. K. BOHRA
National Bureau of Soil Survey and Land use, Nagpur	DR G. P. OBI REDDY
Space Applications Centre, ISRO, Hyderabad	SHRI SHASHIKANT A. SHARMA

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BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002

Telephones : 2323 0131, 2323 3375, 2323 9402

Website: www.bis.org.in

Regional Offices:

Telephones

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg
NEW DELHI 110002

{ 2323 7617
2323 3841

Eastern : 1/14 C.I.T. Scheme VII M, V. I. P. Road, Kankurgachi
KOLKATA 700054

{ 2337 8499, 2337 8561
2337 8626, 2337 9120

Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022

{ 260 3843
260 9285

Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113

{ 2254 1216, 2254 1442
2254 2519, 2254 2315

Western : Manakalaya, E9 MIDC, Marol, Andheri (East)
MUMBAI 400093

{ 2832 9295, 2832 7858
2832 7891, 2832 7892

Branches: AHMEDABAD. BENGALURU. BHOPAL. BHUBANESHWAR. COIMBATORE. DEHRADUN. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KOCHI. LUCKNOW. NAGPUR. PARWANOO. PATNA. PUNE. RAJKOT. VISAKHAPATNAM.